(12) UK Patent Application (19) GB (11) 2 205 309 (13) A

(43) Application published 7 Dec 1988

(21) Application No 8712328

(22) Date of filing 23 May 1987

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(51) INT CL*
B65D 47/06

(52) Domestic classification (Edition J):
B8T DAX
U1S 1080 1105 B8T

(56) Documents cited
GB A 2095099 GB A 2053865 GB 0698633
EP A2 0094235 US 4428498 US 4388996
US 4345695

(58) Field of search
B8T
Selected US specifications from IPC sub-class
B65D

(54) Lids for drinking cups

(57) A detachable lid for use with a disposable drinking cup enables the user to drink with the lid in position. The lid comprises a rim 3 adapted to form a substantially fluid tight seal with the inner or outer edge of the open end of the cup, a fluid exit aperture 5 located close to the rim and an air entry aperture 7 located close to the rim and substantially diametrically opposite to the fluid exit aperture. The fluid exit aperture and/or the air entry aperture may be a group of closely spaced holes and the edges of the hole or holes forming the fluid exit aperture may have a neck 6 extending downwards into the cup. The lid may carry a relief design and may also contain additives for the beverage within the cup. The lid is preferably manufactured from synthetic polymers.

Figure 1

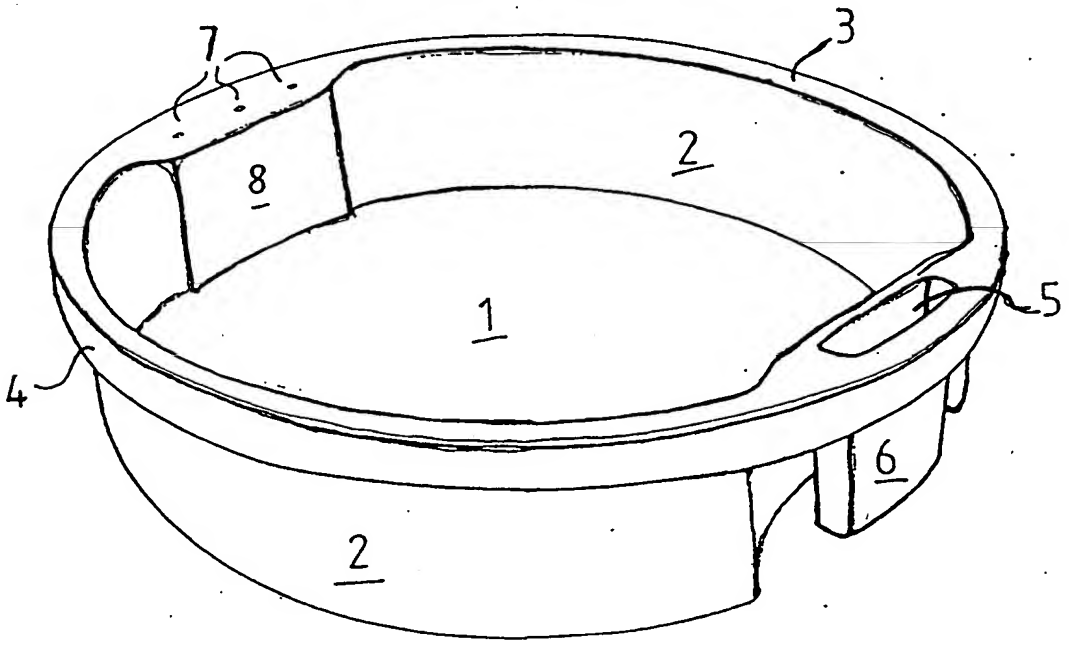

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Figure 1

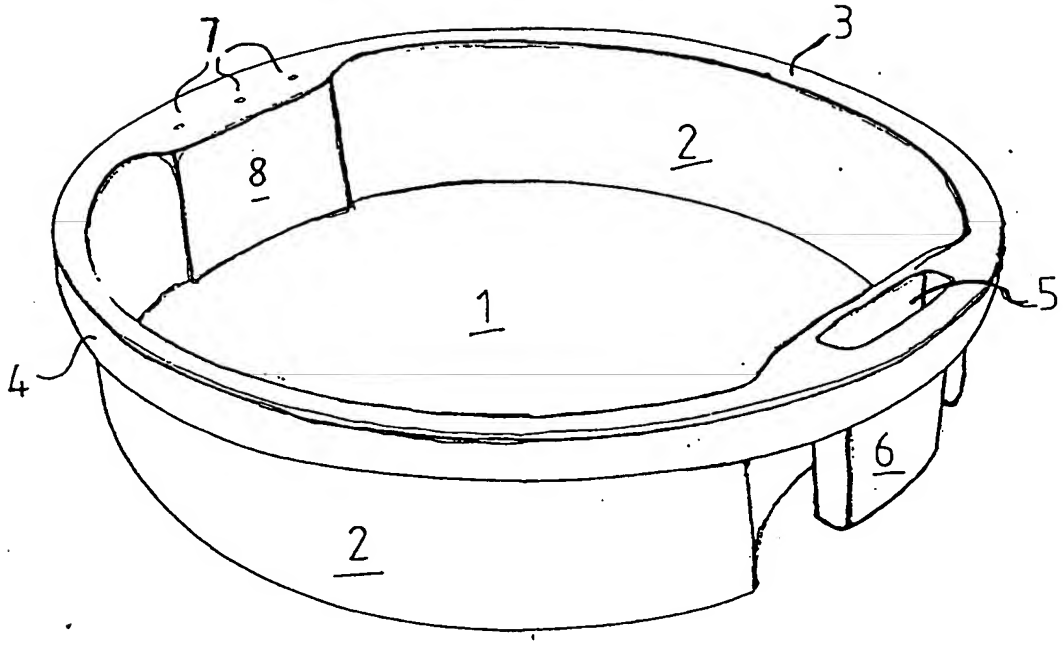


Figure 2

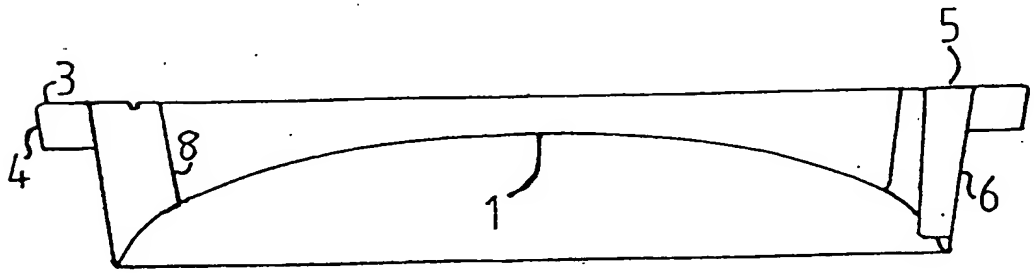


Figure 3

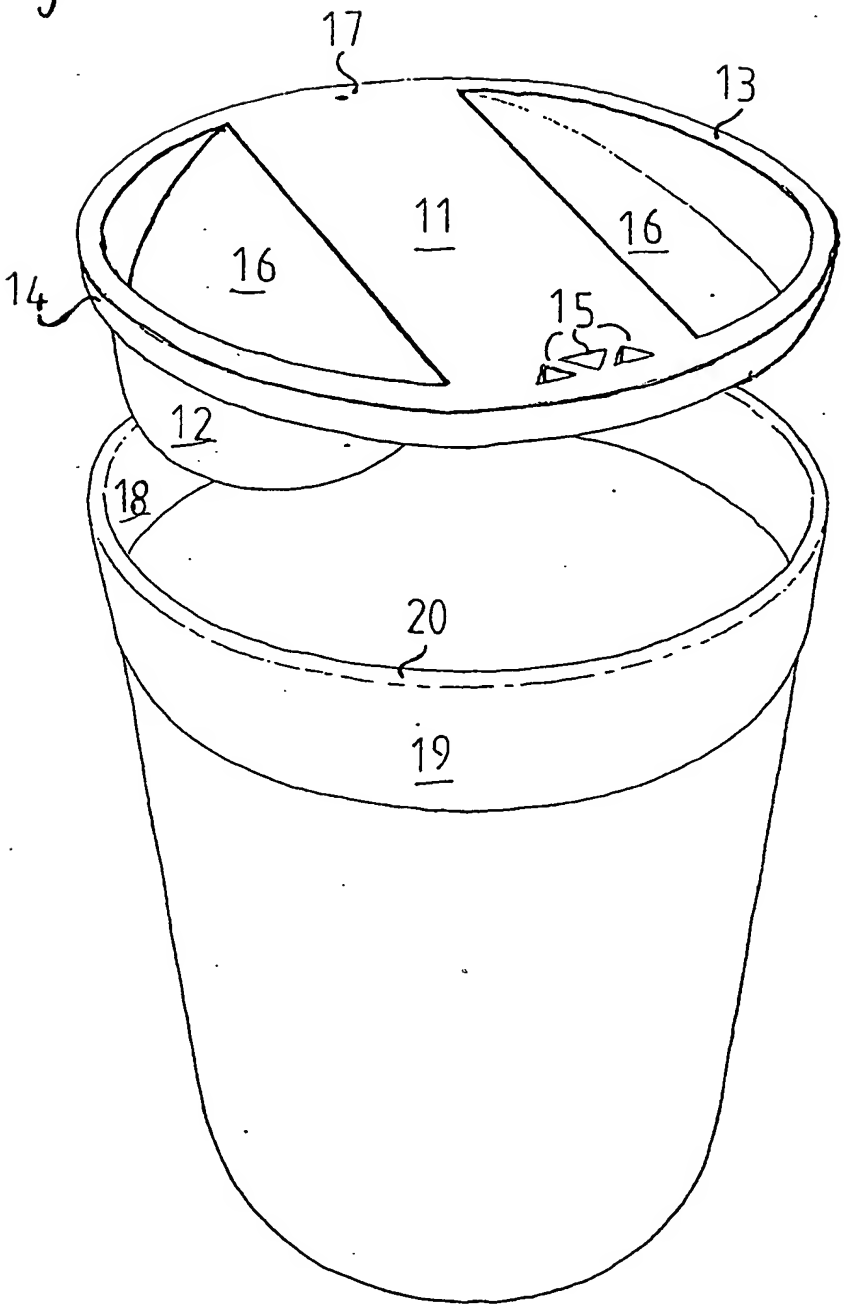


Figure 4

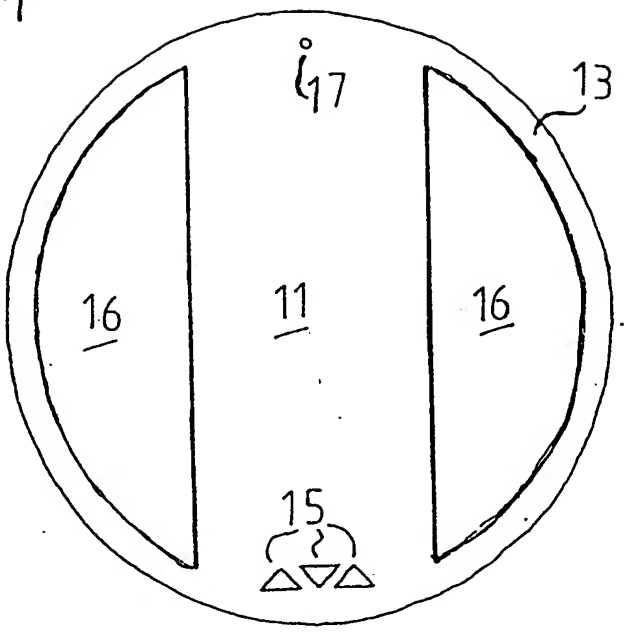
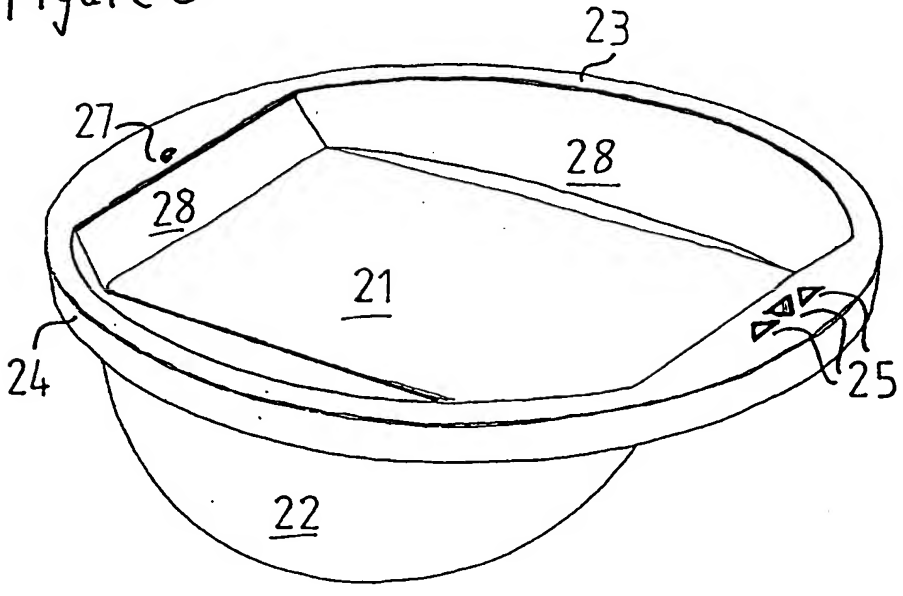


Figure 5



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LIDS FOR DRINKING CUPS.

This invention relates to detachable lids for use with disposable drinking cups enabling the user to drink with the lid in position.

It is becoming the custom for hot and cold beverages to be supplied by vending machines, snack bars and similar establishments in disposable containers fabricated from paper or synthetic polymers. It is frequently necessary to carry a full cup from the place at which it has been dispensed to a different place where it is to be consumed. Such journeys are hazardous, particularly in a moving vehicle such as a train or ship, and spillage is frequent.

To reduce spillage it is common to supply a disposable lid or cap which fits over the top of the cup making it more rigid and providing a more or less fluid-tight seal. The centre of such a lid may be pierced to prevent the build-up of pressure. The pierced aperture may be adapted to allow the entry of a drinking straw. Normally the disposable lid is removed and discarded when drinking a beverage from a cup unless a straw is used. Unfortunately in moving vehicles and in crowds there is a considerable possibility of spillage when the lid is removed from the cup to enable the contents to be drunk. The use of a straw avoids this spillage but is unacceptable for hot beverages, such as tea or coffee, and is liable to cause injury to the mouth if used in a jolting vehicle.

The present invention provides a cup lid which allows a user to drink from the lidded cup at any time with very little risk of spillage.

According to the present invention there is provided a lid for a cup comprising a rim adapted to form a substantially fluid tight seal with the inner or outer edge of the open end of the cup, a fluid exit aperture located close to the rim and an air entry aperture located close to the rim and substantially diametrically opposite to the fluid exit aperture.

The fluid exit aperture may be a single hole or a set of closely spaced holes which can easily be covered by the lips of the user. The edges of the hole or holes preferably have a neck extending downwards into the associated cup.

The air entry aperture may be smaller than the fluid exit aperture. It may be a single hole or a group of closely spaced holes.

The lid may carry relief designs, such as a manufacturer's or supplier's name or trade mark, or strengthening ribs. The lid may also contain additives for the beverage within the cup such as sugar and/or milk for beverages such as tea and coffee or salt and pepper for soup. The additives may be released into the beverage by contact with the fluid within the cup or selectively under the control of the user.

The additives may be encapsulated in a water soluble film, such as gelatin, alginate, a cellulose derivative or other non-toxic material which softens or dissolves in aqueous fluids. Alternatively the additives may be sealed within the lid by means of a water impermeable membrane, such as a polyolefin film or aluminium foil, which is ruptured or removed by the user before placing the lid on the cup. If two or more additives are incorporated in the lid and added according to the taste of the user the latter embodiment is preferred. The user can rupture or remove a selected

portion of the membrane and release the desired additive; e.g. sugar but not milk, leaving the other encapsulated.

In an alternative embodiment the additives are retained in the lid by means of compartment having an aperture which is closed by a slidable member which can be withdrawn by the user to release the additive. Other mechanical release systems may be used however in many cases their use may be precluded by manufacturing costs.

The lid may be fabricated from any suitable material which is resistant to hot and/or cold aqueous beverages. It can easily be manufactured using synthetic polymers by conventional mass production methods. The choice of material for fabricating the lid is dependant upon the method of manufacture chosen. In general most thermoplastic synthetic polymers are suitable such as polystyrene, polyolefins, polyvinyl esters, polyvinyl-acetals, polycarbonates, cellulose esters, polyamides, acrylic polymers and copolymers such as ABS.

If the lid is to be disposable it is preferably manufactured from a thermoplastic resin by the vacuum forming process using a sheet of thermoplastic material such as polystyrene. Alternatively the injection moulding process can be used to form the lid using a thermoplastic resin such as polypropylene. The synthetic polymers used in either method of manufacture can be pigmented and contain other additives, such as stabilisers, according to conventional practice. Where small numbers are involved the lids may be made from low temperature curing resins such as unsaturated polyester and epoxy resins reinforced with glass or other fibre.

If the lid is to be re-useable it may of course be fabricated from ceramic or metal as well as thermoplastic or thermosetting polymer compositions however materials

which do not conduct heat are preferred. The diameter of the lid will depend upon the diameter of the open end of the cup with which it is to be used. In general the diameter will lie in the range 50mm to 100mm.

The invention will be further described with reference to the accompanying drawings in which:
Figure 1 is a perspective view of a lid according to the invention,
Figure 2 is a section across the lid shown in Figure 1,
Figure 3 is a perspective view of a second embodiment of the lid showing its relationship to a cup,
Figure 4 is a plan view of the lid shown in Figure 3, and
Figure 5 is a perspective view of a further embodiment of a lid according to the invention.

In one embodiment of the invention the lid, see Figures 1 and 2, consists of a domed cover, 1, surrounded by a rim, 2, adapted to engage the inside surface of a cup, not shown. The rim 2 carries an upper portion, 3, which engages the open end of the associated cup, and a flange, 4, which overlaps and surrounds the top of the cup. When in use the combined action of the rim 2, upper portion 3 and flange 4 forms a substantially fluid tight seal with the associated cup.

A fluid exit aperture, 5, is located on the periphery of the cover 1 close to the rim 2. The aperture 5 has a tubular portion 6 which extends downwardly into the associated cup. On the periphery of the cover 1 diametrically opposite to the fluid exit 5, lies an air entry aperture consisting of a number of small holes, 7. The upper portion 3 is made wider at this point so that the flow of air through the holes 7 is not impeded by the upper edge of the associated cup. The rim 2 in this area has a portion extending inwardly 8.

The tubular portion 6 of the fluid exit aperture 6 has one surface which engages the inside wall of the associated cup. The upper portion 3 of the lid is also made wider at this point so that it may engage the upper edge of the associated cup.

After the associated cup has been filled with the desired beverage the lid is placed over the top and pressed downwards. The rim 2 will abut the inside surface of the cup, the upper portion 3 will engage the upper edge of the cup and the flange 4 will engage the outer surface of the cup. The holes 7 will allow any entrapped air to escape when the lid is fitted to the cup.

The fluid tight seal provided by the engagement of the lid with the cup allows the full cup to be carried vertically without risk of spilling the contents. When the holder wishes to consume the contents of the cup it is unnecessary to remove the lid. The lips are placed over the exit aperture 5 and the contents are extracted by gentle sucking action while tipping the cup towards the horizontal. As the fluid contents are removed air enters through the holes 7. By tipping the cup into the horizontal position all the contents can be extracted from the cup.

A second embodiment of a lid, see Figures 3 and 4, shows its relationship with its associated cup.

The lid consists of a cover having a flat top 11 joining the fluid exit aperture and the air entry aperture and two downwardly angled portions 16. An incomplete rim, 12, projects downwardly to engage the inside surface, 18, of a cup, 19. The rim 12 and the flat top 11 join an upper portion, 13, which form the periphery of the lid. The lower surface of the portion 13 engages an upper edge, 20, of the associated cup 19. A flange, 14, overlaps and surrounds the upper edge 20. When in use the combined

action of the rim 12, upper portion 13 and flange 14 forms a substantially fluid tight seal with the associated cup 19.

A fluid exit aperture, 15, is located on the periphery of the flat top 11 of the cover close to the rim 12. The aperture 15 consists of a set of three holes having tubular portions, not shown, which extend downwardly into the associated cup 19. Diametrically opposite to the fluid exit 15, lies an air entry aperture consisting of a single small hole, 17. The exit aperture 15 and the air entry aperture hole 17 are spaced inwardly from the periphery so that the flow of air through the hole 17 and the flow of fluid through the aperture 15 is not impeded by the upper edge 20.

The third embodiment of a lid, shown in Figure 5, is a variation of the embodiment shown in Figures 3 and 4 using a different arrangement for the cover.

The lid consists of a cover having a flat central portion, 21, recessed below an upper portion, 23. The central portion 21 is connected to the upper portion 23 by a series of panels, 28. An incomplete rim, 22, projects downwardly to engage the inside surface of an associated cup.

A fluid exit aperture, 25, is located on the periphery of the upper portion 23. The aperture 25 consists of a set of three holes as described with reference to figures 3 and 4. Diametrically opposite to the fluid exit 25, lies an air entry aperture consisting of a single small hole, 27. The exit aperture 25 and the air entry aperture hole 27 are spaced inwardly from the periphery so that the flow of air through the hole 27 and the exit of fluid from the aperture 25 is not impeded by the upper edge 23.

In all the embodiments illustrated the lids may be fabricated by the vacuum forming process using sheet thermoplastic material. Such operations are well known and may be carried out automatically and at high speed using commercially available apparatus.

CLAIMS.

1. A lid for a cup comprising a rim adapted to form a substantially fluid tight seal with the inner or outer edge of the open end of the cup, a fluid exit aperture located close to the rim and an air entry aperture located close to the rim and substantially diametrically opposite to the fluid exit aperture.

2. The lid for a cup as claimed in claim 1 in which the fluid exit aperture is a group of closely spaced holes.

3. The lid for a cup as claimed in either claim 1 or claim 2 in which the edges of the hole or holes forming the fluid exit aperture have a neck extending downwards into the associated cup.

4. The lid for a cup as claimed in any of the preceding claims in which the air entry aperture is a group of closely spaced holes.

5. The lid for a cup as claimed in any of the preceding claims which carries a relief design.

6. The lid for a cup as claimed in any of the preceding claims which carries one or more additives for addition to beverages within the associated cup.

7. The lid for a cup as claimed in any of the preceding claims fabricated from a thermoplastic polymer.

8. Lids for cups as claimed in claim 1 and as herein described.

9. A cup fitted with a lid as claimed in any of the claims 1 to 8.

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